

## Virginia Ground Spiders: A First List (Araneae: Gnaphosidae)

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### ABSTRACT

Forty-five species of ground spiders (gnaphosids) are documented as known members of the Virginia fauna, about 75% of an anticipated total of 60 to 65 species. Thirteen of the 45 species are listed for the state for the first time, some representing substantial range extensions, mostly from the south, but a capture of *Nodocion rufothoracicus* is the first record for that species east of the Mississippi River. One undescribed species, a minute form of *Drassyllus*, is known from Isle of Wight County. Twenty-four species are known from less than five counties, only six are known from more than 15; *Zelotes duplex* has been documented for 19 counties. Although many species are essentially statewide, at least at low elevations, 15 reflect lowland (austral) distributions, and five are chiefly or entirely restricted to higher elevations.

*Key words:* distribution, Gnaphosidae, ground spiders, Virginia.

### INTRODUCTION

Ground spiders (gnaphosids) comprise an important and sometimes conspicuous element in the fauna of forest litter or dry open habitats, and are often taken in large numbers by standard pitfall trapping procedures. Some species, in both appearance and movement, are distinctive ant-mimics. Although the family has had its share of confusion and unsatisfactory taxonomy in the past, the North American species are now clearly defined and accessible for studies of their biology and distribution thanks to the series of excellent generic revisions generated by Drs. N. I. Platnick and M. Shadab (1975-1988). Because of their inclusion of spot maps, it is possible to learn quickly which species are known from particular areas, and those likely to be discovered by local field work.

As a result of extensive statewide inventory sampling carried out by the Virginia Museum of Natural History (VMNH), Division of Natural Heritage, Virginia Department of Conservation and Recreation (VDNH), and other parties involved in survey activities, knowledge of the Virginia fauna of gnaphosids has been substantially improved during the past two decades. Of the approximately 60 species whose known ranges imply local occurrence, 45 (or 75%) are now documented from captures within the Commonwealth. As this number obviously represents all of the abundant and widespread species (plus several of those seldom collected), it seems likely that a long time may pass before all of the

remaining 25% are finally discovered and accounted in a definitive report. Some may in fact even be represented in the extensive backlog of unidentified gnaphosids now accumulated at VMNH with little or no possibility of being studied in the foreseeable future.

It is virtually a characteristic of small arthropods that within a particular group of species some will be captured during almost every collecting effort while others – even some with extensive ranges – seem to be found only occasionally by serendipity. It is uncertain whether the latter are actually rare in the sense of existing only in small, widely separated populations, or whether they occupy habitats likely to be discounted by the anthropocentric bias of collectors. Among local gnaphosids this situation is demonstrated clearly in the genus *Sergiolus*. Known distributions suggest that seven species should occur in Virginia. Only one, *S. capulatus*, is frequently taken, with records for 15 counties across the state. Two others, *S. minutus* and *S. ocellatus*, are each known from two localities. A third species, *S. cyaneiventris*, has been found only once. Three others have yet to be captured in Virginia although they are widespread in eastern North America and are known from adjoining states. In this case, collector bias does not seem to be relevant, inasmuch as pitfall traps have been set in all parts of the state, in a wide spectrum of habitat types, and operated throughout the year.

Another interesting feature of small arthropods is the frequency with which they exhibit totally unpredictable, disjunct, distributions. For instance, the gnaphosid

*Nodocion rufithoracicus* is common and widespread in western North America (P&S 1980, map 2), but was unknown east of the 104<sup>th</sup> meridian until an adult male was collected in a remote, natural habitat in central Virginia. An analogous case is afforded by the minute lygaeid bug *Botocudo modestus*, which ranges from Arkansas and Missouri west to California, but occurs also on Wallops Island, Virginia (Hoffman, 1999). Such sporadic distributions imply that almost any gnaphosid known from east of the Rocky Mountains has the potential of being discovered in very localized Virginia populations, and postpones almost indefinitely achievement of a definitive number of endemic species. I have not compiled lists of species for other eastern states from the papers by Platnick & Shadab, but suspect that around 60-70 may be the maximum number (increasing southward) to be expected for most. The list of Maryland spiders compiled by Muma (1945) contains only 16 gnaphosids, but was based on a sampling interval of only four years with minimal use of pitfall trapping. Kaston (1981) tabulated 39 species for all of New England. Heiss & Allen (1986) reported 40 species for the relatively well-collected Arkansas, Gaddy (1985) listed 19 for South Carolina, and the gnaphosid fauna of Michigan is credited with 47 species (Sierwald et al., 2005). In view of these circumstances, the present list – based on authoritative published information and material at VMNH – is merely a progress report which provides a baseline to be augmented by future activities. Half a loaf is better than none, and a start must be made sometime.

Unless specifically stated otherwise, all samples listed in the following entries are in the Virginia Museum of Natural History, the acronym VMNH is therefore omitted. Numbers of specimens by sex are indicated as (male/female). Collection dates for pitfall trap samples are provided when known (e.g., 3 June-12 July), but in many cases the collector recorded only the date of actual removal from the trap; generally a trapping interval of about one month is to be assumed in such cases. The abbreviation DF denotes capture in a drift fence-pitfall combination. The acronym AMNH specifies the American Museum of Natural History collection.

The baseline reference for the following account is the series of generic revisions prepared by Drs. Platnick and Shadab from 1975 to 1988. Reference to these various papers follows a conventional abbreviation of their surname initials: e.g., P&S 1980.

For the purposes of a local listing, simple alphabetical sequence at the level of both genera and species seems the most practical method of presentation. A distribution of our genera into subfamilies is accessible in the “Spiders of North America: An Identification Manual” (Ubick et al., 2005), which provides keys to the genera of North America and excellent illustrations of important

structures. In the following list, species based on documented voucher specimens are numbered and set in **boldface** type; entries for probable additional taxa are placed in their correct position but are unnumbered and set in *italic* type.

## ANNOTATED SPECIES LIST

### 1. **Callilepis pluto** Banks

This species is widespread in North America, from Maine to British Columbia, southward in the Appalachians and western mountain systems, but notably absent from the Mississippi embayment and the southeastern Coastal Plain (Platnick, 1975, fig. 1). In Virginia it is statewide, with collections from Augusta, Campbell, Fairfax, Giles, Greensville, Henrico, Henry, Isle of Wight, Mecklenburg, Northampton, Page, and York counties, and the City of Virginia Beach. The record for *C. imbecillis* from “top of Blue Ridge near Roanoke” by Crosby & Bishop (1926) is probably based on a specimen of *C. pluto*.

#### *Callilepis imbecillis* (Keyserling)

As documented by Platnick (1975, map 2), this species is almost completely allopatric with the foregoing, occurring along the Gulf Coast from southern Georgia to southern Texas, thence northward to Lake Superior and Ohio. Although no material intermediate between the two taxa has been reported, the illustrated differences in genital structures between them seem relatively trivial, and a case for subspecific relationship might be admitted. Inclusion of *C. imbecillis* as a possible member of the Virginia biota is based on a single male from First Landing State Park, Virginia Beach, which Dr. Platnick felt was this species although both male palpal organs seem a little deformed. Such an identification is at least plausible geographically.

#### *Callilepis* new species?

A specimen from Antioch Pines Natural Area Preserve, south of Zuni, Isle of Wight County, differs enough in palpal structure from the two eastern congeneric species that confirmation from larger series might justify recognition of the population as a distinct species.

### 2. **Cesonia bilineata** (Hentz)

This common and easily recognized eastern species occurs from Ontario to southern Florida, west and south through Texas to Tamaulipas, with outlying records for

Manitoba and New Mexico (P&S, 1980, map 1). It is widespread in Virginia although records are lacking for the higher mountains. Augusta, Campbell, Cumberland, Dickenson, Essex, Fairfax, Floyd, Greenville, Henrico, Isle of Wight, Loudoun, and York counties and the City of Virginia Beach (where it is abundant in First Landing State Park).

### 3. *Drassodes auriculoides* Barrows

The distribution of this spider is largely confined to northeastern United States (Cape Cod to Wisconsin, south to Tennessee, with a disjunct locality in the Ozarks). Virginia records are from Appomattox, Augusta, Cumberland, Giles, Greenville, Montgomery, Prince William, Page, and York counties, all but one at elevations below 1000 feet (300 m). Most collections are represented by single males only.

### 4. *Drassodes gosiutus* Chamberlin New State Record

The curious distribution of this species does not seem to conform to any biogeographic pattern. The nuclear part of the range appears to be in the southern Rockies, but with representation in the Great Plains, the Great Lakes region, southern Alabama, eastern Tennessee, and southern New York and adjoining states. Perhaps this pattern of discontinuity results from condensation of a previously continuous distribution. Our single Virginia record extends the range slightly southward from New Jersey: *Accomack County*: Chincoteague National Wildlife Refuge, Assateague Island, White Hills blueberry swamp, 14 October-5 November 1998, S. M. Roble (1/0).

### *Drassodes neglectus* (Keyserling)

As documented by P&S (1976, map 1), this species reflects a typical boreal distribution, from Quebec to Alaska, south through the western mountains almost to Mexico, and from Wisconsin to Connecticut, with a single disjunct record for Pendleton County, West Virginia. There can be little doubt that *D. neglectus* will be discovered in the high mountains of Virginia along the West Virginia border (not improbably even much farther south).

### *Drassyllus adocetus* Chamberlin

With a "lower austral" distribution between Long Island and central Florida, this species is surely native to the coastal region of Virginia. The male palpal organ is one of the most distinctive in the genus, and permits

identification with a degree of confidence not afforded by several other species of *Drassyllus*.

### 5. *Drassyllus aprilinus* (Banks)

This common species is widespread in eastern United States, from New England to Michigan, thence south to Florida and west to central Texas (with a disjunct site in San Luis Potosi). It competes with *D. novus* for the status of our most frequently collected *Drassyllus*, although virtually all of the VMNH pitfall captures consist of a single male. Although apparently statewide, *D. aprilinus* has so far not been collected in the southwestern third of the state, nor at any site above 300 m in elevation. Augusta, Botetourt, Carroll, Cumberland, Fairfax, Fluvanna, Greenville, Henrico, King George, Mecklenburg, Northampton, Page, Prince Edward, Sussex, Warren, and York counties, and the cities of Chesapeake and Virginia Beach. Collections were made in a wide variety of biotopes without any evident commonality.

### 6. *Drassyllus covensis* Exline New State Record

This species is known from only a few widely scattered sites, most of them at low elevations in southeastern United States, and the majority in the Mississippi embayment region. The few Virginia localities correspond to the general pattern of an austral distribution. *Greensville Co.*: DF site at end of Rt 666, 1 mile east of Claresville, 19 May-3 June, 1993, (1/0), 25 May-30 June 1994 (1/1), both VMNH surveys; DF site 2.3 miles northeast of Slate's Corner, 18 June 1990, J. C. Mitchell (1/0). *Mecklenburg Co.*: Elm Hill Wildlife Management Area, 5-22 April 1991, VMNH survey (1/0). *City of Chesapeake*: Fentress Naval Air Station, 11 May 1989 (1/0), 6 June 1989 (8/0), 7 September 1989 (3/0), 27 April 1990 (1/0), all Fentress collections by K. A. Buhlmann.

### 7. *Drassyllus creolus* Chamberlin & Gertsch

The distribution of this species in southeastern United States closely parallels that of *D. aprilinus*; both appear to prefer lowlands with only a few localities in the Appalachians. It was documented by P&S (1982) from Fairfax County and Chesapeake City, to which we can add two sites in the central Piedmont region: *Cumberland Co.*: DF in recently clearcut woods, 2 km south of Columbia, 1 May 1990 (1/0) and 16 June 1990 (1/0), both J. C. Mitchell. *Pittsylvania Co.*: DF site in sandy bottomland, 1.5 miles ENE of Axton, 13 May 1992, VMNH survey (3/2).